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PRODUCING COTTON IN THE SOUTHEAST REGION
PRODUCTION PRACTICES, PROBLEMS AND RESOURCES

W. C. McArthur and Arthur M. Heagler

COMMODITY
ECONOMICS DIVISION

ECONOMIC RESEARCH SERVICE U.S. DEPARTMENT OF AGRICULTURE

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September 1977

PRODUCING COTTON IN THE SOUTHEAST REGION: A DESCRIPTION OF PRODUCTION PRACTICES, PROBLEMS AND RESOURCES

W.C. McArthur and Arthur M. Heagler [1]

Important shifts have occurred in cotton production patterns the last several years within and among geographic areas of the Southeast region. The mix of resources available and production practices employed on individual farms have had a significant impact on the relative strength of cotton in one area compared with another. This paper presents a description of resources and current production practices and problems of growers in these broad sections of the region: Coastal Plain areas, Limestone Valley, and WE Upland area (figure 1).

COASTAL PLAIN AREAS

Location of Production

Cotton production in the Coastal Plain occurs mostly in clusters of counties extending through the middle sections of the area (figure 2). The main cotton area in Georgia is a cluster of four or five counties centering around Dooly County, the leading cotton county in the state. Other key cotton areas in Georgia include single counties: Colquitt in the southwest and Burke County in the northeast part of the Georgia Coastal Plain.

The heaviest concentration of production in South Carolina is an eight-county area extending from Orangeburg County in the southwest part of the area to Dillon and Marlboro Counties in the northeast section. This area accounted for over 85 percent of the South Carolina cotton acreage in 1974.

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[1] Agricultural Economists, Economic Research Service, U.S. Department of Agriculture, stationed at the University of Georgia, Athens, Georgia and Louisiana State University, Baton Rouge, Louisiana, respectively.

PRODUCING COTTON IN THE SOUTHEAST REGION: A DESCRIPTION OF PRODUCTION PRACTICES, PROBLEMS AND POTENTIALS

W.C. McArthur and Herbert H. [illegible] 1/

Important shifts have occurred in cotton production [illegible] the last several years which had strong impacts in areas of the Southeast Region. The mix of resources available and production practices employed by cotton growers have had a significant impact on the relative strength of cotton in our area compared with others. This paper presents a description of production and current production techniques and problems of growers in three broad sections of the region. Coastal Plain areas, Tennessee Valley, and SE Upland area (Figure 1).

COASTAL PLAIN AREAS

Location of Production

Cotton production in the Coastal Plain occurs mostly in clusters of counties extending through the middle sections of the area (Figure 1). The main cotton area in Georgia is a cluster of four or five counties surrounding Dooly County, the leading cotton county in the state. Other key cotton areas in Georgia include single counties; [illegible] in the southwest and Burke County in the northeastern part of the Georgia Coastal Plain.

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SOUTHEAST REGION PRODUCTION AREAS

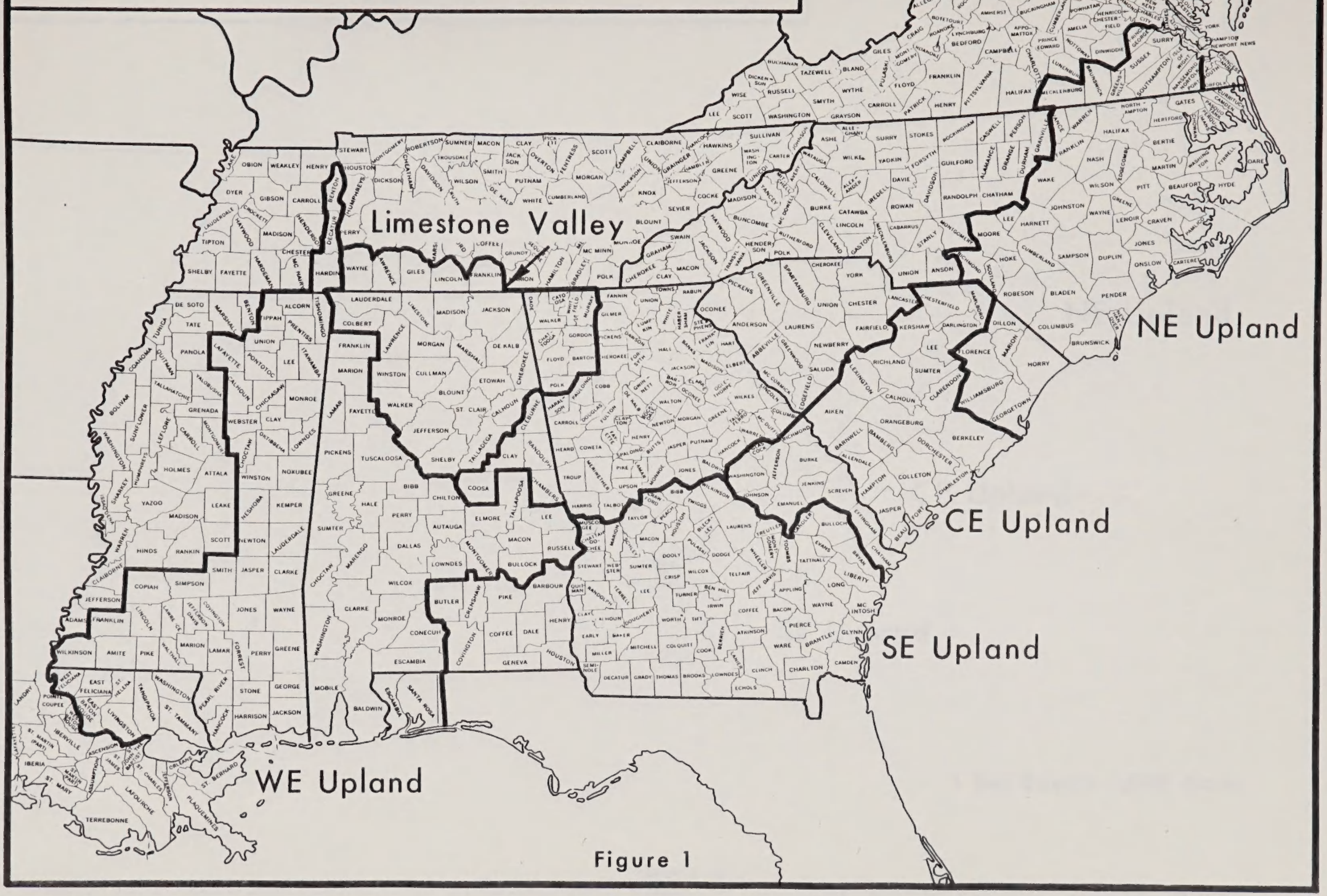


Figure 1

COTTON- PLANTED ACRES COASTAL PLAIN AREAS 1974

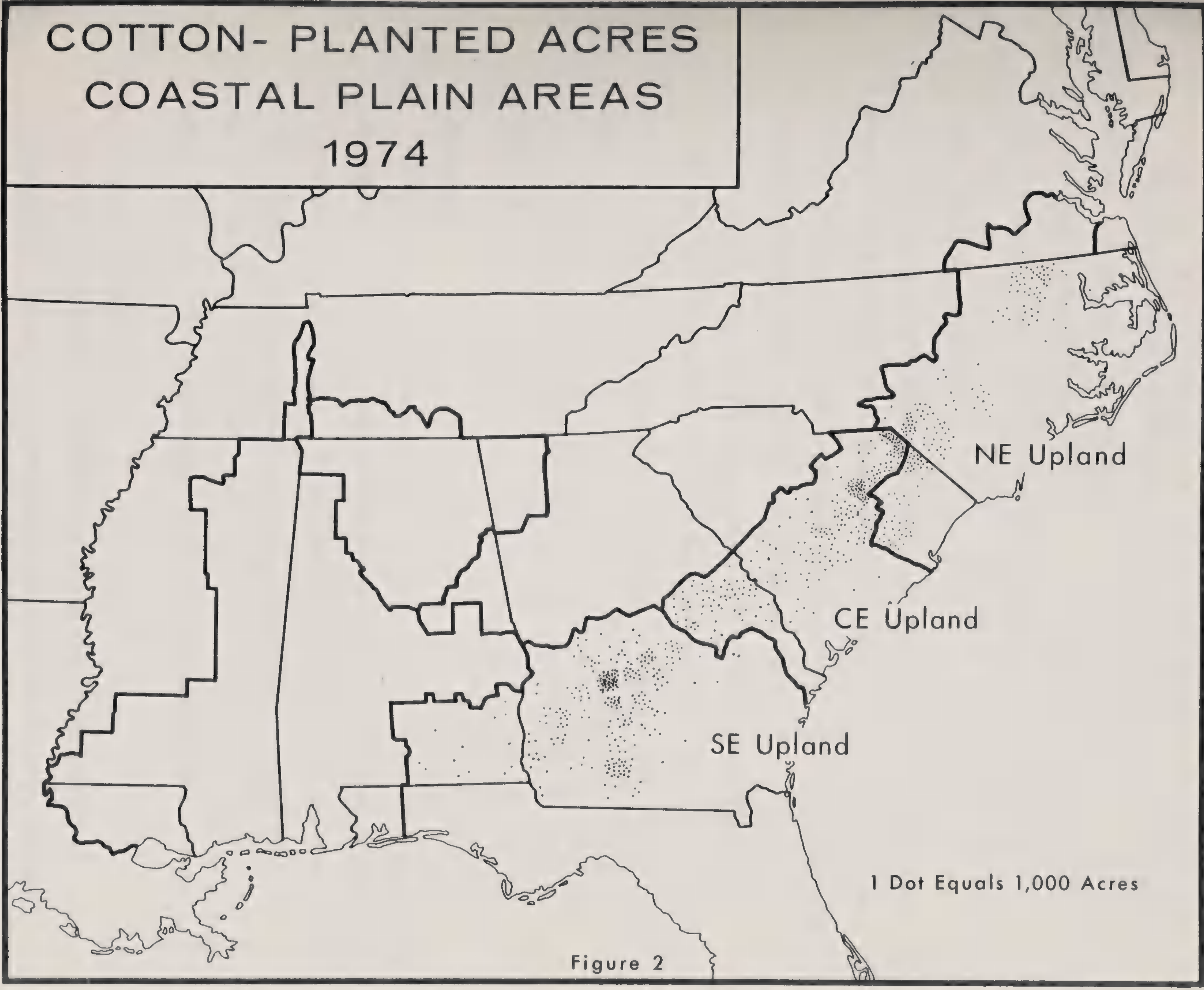


Figure 2

The production of cotton in North Carolina now centers in two relatively small areas. One is a three-county area in the southern Coastal Plain (Robeson, Hoke, and Scotland counties); another is a two-county area in the northern Coastal Plain (Halifax and Northampton).

Soils, Topography, Climate

Most Coastal Plain soils have sandy surfaces underlain with sandy clay loam or clay subsoils. Most soils have gentle to moderate slopes, are well drained, and respond to good management and the use of fertilizer. Elevation ranges from about 200 feet to 500 feet above sea level.

The area has a warm-temperate climate with a frost-free period of 240 to 290 days in the Georgia and Alabama sections and 220 to 250 days in the North and South Carolina sections of the area. Annual rainfall varies from about 40 to 55 inches. Heavy rains and strong winds during the hurricane season sometimes damage crops and delay harvest, particularly in the Carolinas.

Few Growers

A major portion of the cotton in each county is being produced by relatively few growers. These growers are using improved production practices in cotton and competing crops. They obtain yields that are higher than the area average. These individuals generally prefer cotton to other crops in the farm organization. However, they would not be reluctant to shift to other crops when the alternative is clearly more profitable than cotton.

Rental Arrangements

Most of the growers own some land and rent additional land to enlarge their farming operation. Cash renting is a common practice with rental

rates in 1976 ranging from $15 to $35 per acre of cropland in South Carolina and from $30 to $50 in Georgia. Land rented strictly for cotton would cost about $50 per acre.

Land Resources

The acquisition of additional cropland through land clearing and assimilation of pastureland has possibilities in the Coastal Plain; however, it would not materially affect the availability of cropland in a short time period. Consequently, significant increases in the cotton acreage would require a reduction in the acreage of one or more competing crops.

Cropland Base

The Coastal Plain areas contained about 8.1 million acres of harvested cropland in 1969 (table 1). Although there has been some reduction in the cropland base the last several years, the main changes have occurred in land uses and productivity.

Cropland Use

Corn and soybeans account for over 80 percent of the total acreage of major crops in the Coastal Plain as a whole (table 2). The percentage is highest in the central and northeast portions of the Coastal Plain; and lowest in the southeast part of the area where peanuts is a dominant crop. Corn and soybeans are important enterprises in nearly all counties throughout the area. Under present market conditions and government programs cotton is not competitive with tobacco and peanuts for the use of land and other resources. Thus, corn and soybeans are the main alternatives to cotton in the Coastal Plain. Other crops, mainly small grains and pasture

Table 1. Summary of cropland and the acreage of field crops in land capability classes I and IIE, Coastal Plain Areas

Area	Total cropland 1/	Harvested cropland 1/	Field crops acreage in land capability classes 2/ I	IIE	Total
		1,000 acres			
NE Upland:					
A	656	469	101	100	201
B	1,046	681	158	150	308
C	3,334	1,539	175	414	589
D	571	490	9	57	66
Total	5,607	3,179	443	721	1,164
CE Upland:					
A	559	437	122	79	201
B	1,054	675	92	240	332
C	629	412	27	135	162
D	247	149	7	6	13
Total	2,489	1,673	248	460	708
SE Upland:					
A	241	171	17	112	129
B	2,123	1,357	155	704	859
C	877	427	88	286	374
D	1,964	1,151	126	430	556
E	60	24	--	1	1
Total	5,265	3,230	386	1,533	1,919

1/ 1969 Census of Agriculture.

2/ Conservation Needs Inventory, USDA, 1967. Soils in Class I have few limitations that restrict their use; soils in Class IIE are susceptible to erosion that requires moderate conservation practices. Nearly all of the cotton in these areas is restricted to these soils.

Table 2. Planted acreage of major crops, Coastal Plain Areas, 1972-75

Area/Crops	1972	1973	1974	1975
	Planted acreage of major crops (1,000 acres)			
NE Upland:				
Cotton	229	192	174	62
Corn, all	1,369	1,602	1,750	1,760
Soybeans	1,361	1,687	1,606	1,619
Tobacco	306	348	372	446
Peanuts	241	240	255	252
Total	3,506	4,069	4,157	4,139
CE Upland:				
Cotton	377	312	312	107
Corn, all	457	523	628	632
Soybeans	998	1,186	1,187	1,328
Tobacco	17	17	21	23
Peanuts	38	39	38	38
Total	1,887	2,077	2,186	2,128
SE Upland:				
Cotton	291	254	304	115
Corn, all	1,631	1,852	1,980	1,975
Soybeans	552	662	710	869
Tobacco	56	58	71	74
Peanuts	688	691	691	702
Total	3,218	3,571	3,756	3,735

Source: Statistical Reporting Service, County Statistics, 1972-75.

crops, can shift to cotton depending upon price relationships between cotton and the substitute crops.

Although there are exceptions, tobacco is not usually found on farms with a substantial cotton acreage. Cotton and tobacco compete for management time and other resources during critical periods of production. For the most part, the counties where tobacco is important have relatively small cotton acreages (figure 3). However, several important cotton counties also have a large peanut acreage (figure 4).

Yield Trends

There has been some upward trend in cotton yields in the Coastal Plain the last several years (table 3). The change is most marked in the areas embracing Coastal Plain counties in Georgia and South Carolina. The leading cotton counties (area A in table 3) show even greater increases in yield over the specified time period. For example, the area designated SE Upland A shows average yields of 297 pounds per acre for the period 1947-1956; 489 pounds for 1956-1965; and 590 pounds for 1965-1974. Acreages and production from 1947 to 1974 are shown in appendix tables 1-3.

Machinery Use

The use of four-row equipment is still a common practice on most farms in the area. However,there is some shifting to six-row equipment where field size and shape will permit.

Many farms have a larger inventory of farm machinery and equipment than one might expect. This is related partly to the preference for additional machine capacity during critical periods in the production process where timeliness in performing field operations is an important consideration.

TOBACCO-PLANTED ACRES
COASTAL PLAIN AREAS
1974

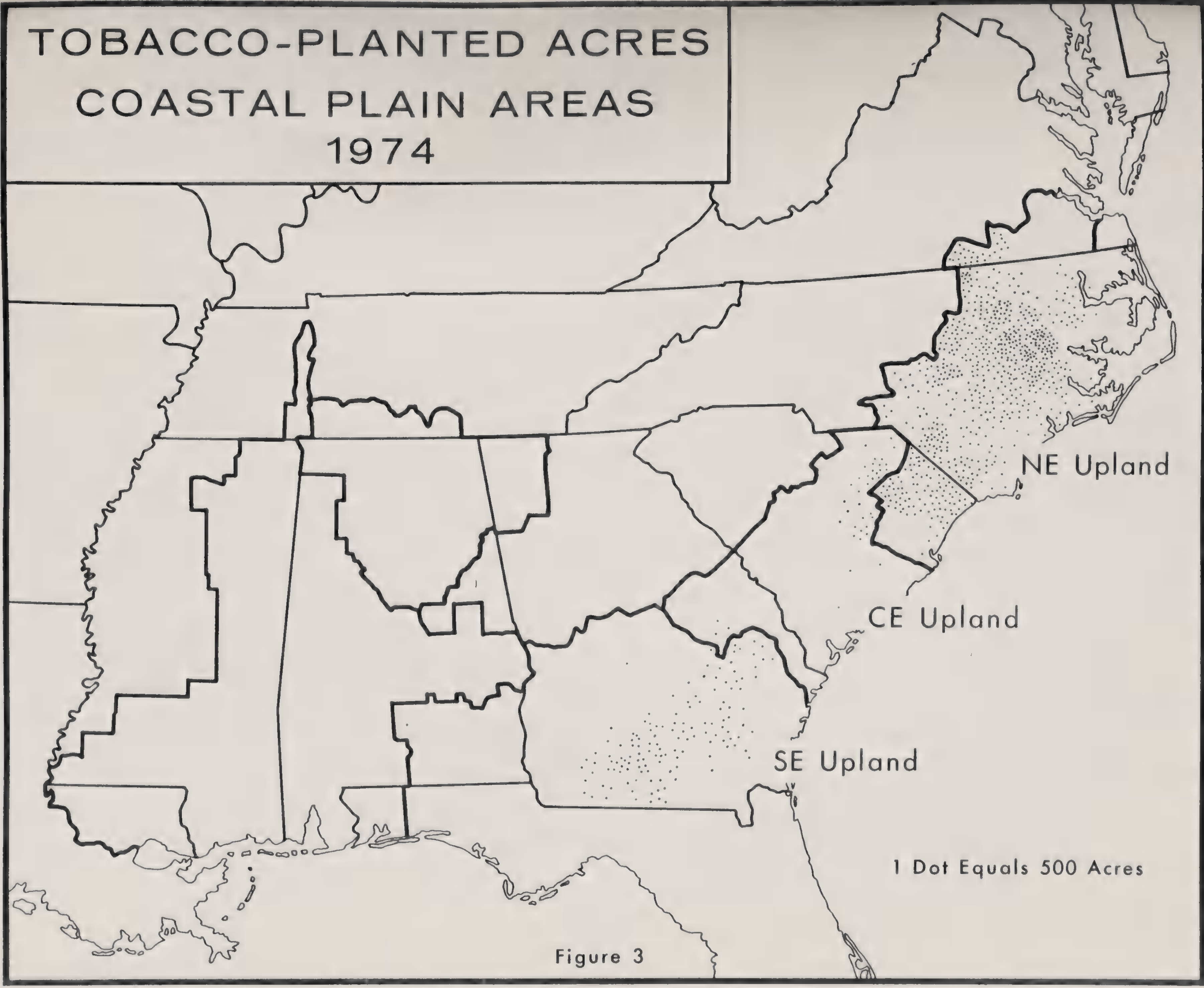
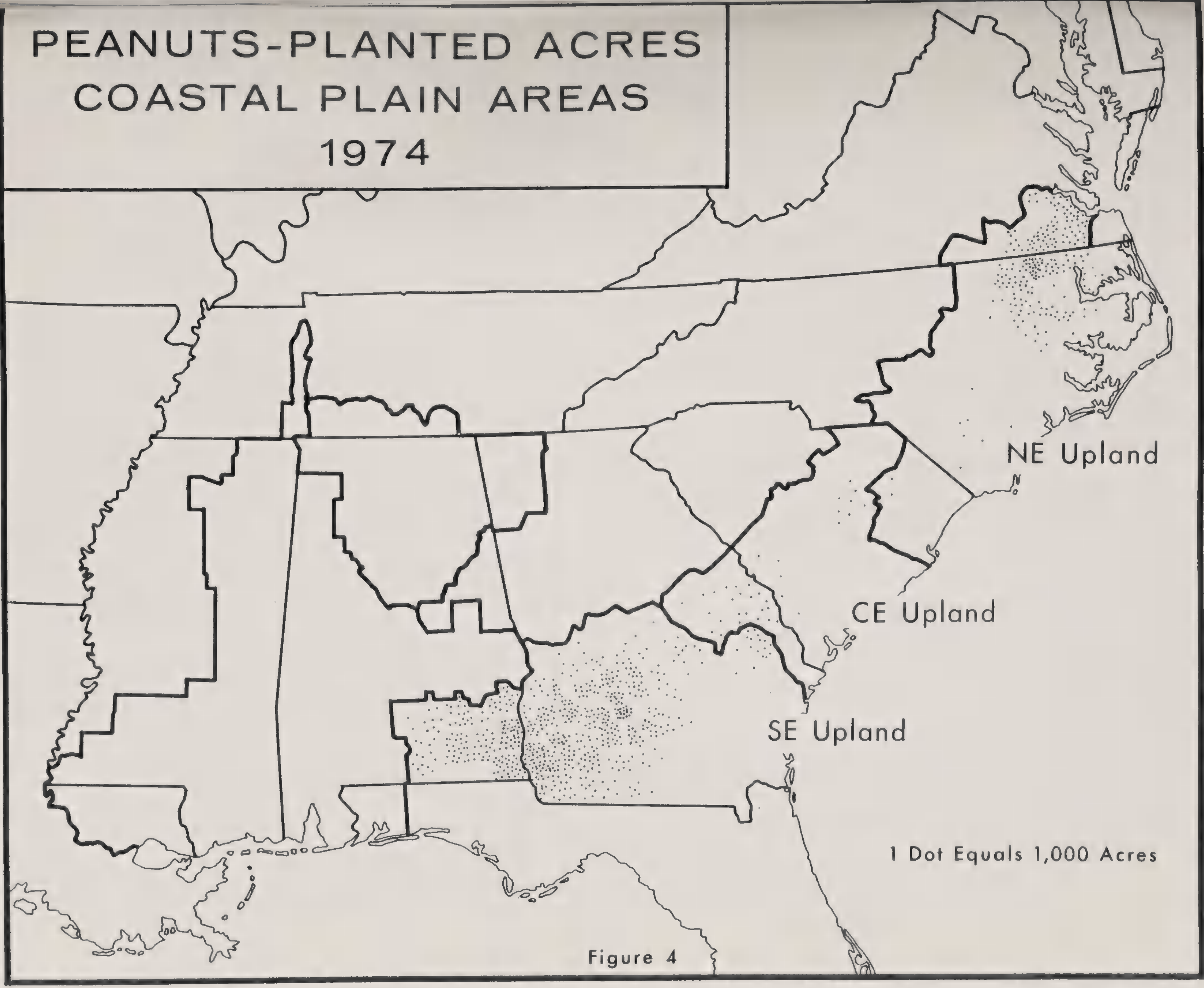


Figure 3

PEANUTS-PLANTED ACRES
COASTAL PLAIN AREAS
1974



1 Dot Equals 1,000 Acres

Figure 4

Table 3. Cotton yields for specified time periods, Coastal Plain Areas 1/

Area	Average pounds of lint per acre harvested		
	1947-56	1956-65	1965-74
NE Upland:			
A	322	379	401
B	315	354	318
C	310	353	272
Area average	316	364	363
CE Upland:			
A	341	432	473
B	275	396	410
C	282	400	377
Area average	299	410	434
SE Upland:			
A	297	489	490
B	288	428	428
C	274	379	330
Area average	279	404	427

1/ Area delineations are shown in figure 1. The breakdown within areas reflects groups of counties ranging from the most important cotton counties (Area A) to the least important cotton counties (area C).

Delay of a few days in certain operations during critical periods of the production season can cause lower crop yields and loss of income for that year. Consequently, farmers tend to over expand the machinery complement in order to meet tight performance schedules.

Production Practices and Problems

The key cotton farmers of the Coastal Plain areas use improved practices and production systems most suited to their particular situation. At the same time they are open to change or the adoption of new practices which show promise of increasing production and income. Although farm-to-farm differences occur in resource situations and management strategies, there is considerable uniformity in the input mix and production practices employed by different growers.

Insect Control

The management or control of insects is a critical problem facing cotton growers in all parts of the Coastal Plain. Insect control comprises a major component of the cost of producing cotton. The boll weevil, cotton bollworm and tobacco budworm are the most destructive insect pests in all areas. The infestation of tobacco budworm has been increasing in recent years. Spraying to control early season insects destroys beneficial insects and thus increases the difficulty and expense of controlling late season insects (boll weevil and bollworms).

In a normal year insect control requires 16 to 18 applications of insecticides in the southeast part of the Coastal Plain (Alabama and Georgia) and 12 to 16 applications in the central (South Carolina) and northeast part (North Carolina). The use of a systemic insecticide at

planting for early season control is a fairly common practice; spraying for insect control normally begins by late June to mid July and extends to the middle of September.

Air service is a common method of applying insecticides. At present about 50 to 70 percent of the coverage is by air; and 30 to 50 percent with ground equipment, usually a high-clearance sprayer. The fan sprayer is also gaining acceptance as an effective way of applying insecticides.

Nematode control is a growing problem on many cotton farms. The use of a nematicide is a common practice; another control measure used less frequently includes rotating cotton with grass-rooted crops, such as small grains, sorghums, and millet. The nematicide is often applied in the bedding operation; another fairly common practice is to apply the material at planting.

Weed Control

The treatment of land with a preplant incorporated herbicide is a common practice. This treatment is usually followed with surface applied preemergence herbicides or early postmergence herbicides by direct spray. A late postemergence or layby treatment is also fairly common. Thus the weed control program includes one to three herbicide treatments and two to three mechanical cultivations. Very little,if any,hand weeding of cotton now occurs.

The control program covers a variety of broadleaf weeds and grasses which reduce cotton and soybean yields in particular. The use of selected chemicals in combination with the mechanical cultivations provide an effective weed control program for most farms.

Fertilizer Use

Most cotton growers broadcast a mixed fertilizer before bedding the land for planting. A few growers apply fertilizer at planting; most apply nitrogen as a sidedressing. There is some shifting to preplant application of nitrogen.

The usual rates of fertilizer for the Coastal Plain as a whole range from 70 to 80 pounds of nitrogen (N), 50 to 60 pounds of phosphate (P_2O_5) and 90 to 100 pounds of potash (K_2O). An application of lime every two to three years is a common practice. Custom services are used by most growers to spread lime. About 70 percent of the preplant fertilizer is applied by custom services.

Land Preparation and Planting

Chiseling or subsoiling and bedding is a common practice in most of the Coastal Plain. Flatbreaking and chiseling are still common practices on the heavier clay loam soils.

The usual field operations in seedbed preparation include: cutting stalks (immediately after harvest), disking, chiseling or flatbreaking, broadcasting fertilizer, applying herbicides and incorporating with a disk harrow, chiseling or subsoiling and bedding, and conditioning rows for planting. The latter operation is performed with a tiller as a separate operation ahead of planting or with an attachment to the planter for smoothing or shaping the beds.

The usual planting dates are April 10-20 in the southeast sections of the Coastal Plain, April 15-30 in the central portion and April 20 to May 10 in the northeast sections.

Harvesting and Hauling

Defoliation of cotton ahead of harvest is a common practice. This operation usually includes one application of a defoliant by air service.

Two-row self-propelled mechanical pickers are now used by most cotton growers. The use of four-bale or six-bale cotton trailers or wagons is typical on most cotton farms. Standard pickup trucks are typical sources of power for the cotton trailers or wagons.

Some custom harvest and hauling of cotton occurs in the area; however, this service is not widespread in the Coastal Plain.

Crop Rotations

Farmers in the Coastal Plain, as a general rule, do not include cotton in a specified or set crop rotation. However, they do tend to move their cotton acreage from one field to another from time to time. This kind of change interrupts the pattern of continuous cotton in fields over a long period of time; thus this practice achieves the effects of a limited rotation.

WE UPLAND PRODUCTION AREA
ALABAMA, MISSISSIPPI, AND LOUISIANA

Land Resources and Production

This region encompasses a major portion of the land area in Alabama and Mississippi plus the "Florida" parishes in Louisiana. Designated as WE Upland, the area contained about 2.8 million acres of harvested cropland in 1969 (table 4).

Three distinct terrain and soil situations exist in this region. The Prairie or Black Belt area forms a partial crescent ranging

Table 4. Summary of cropland acreages (1969) and acreages of field crops in land capability classes I and IIE (1967), WE Upland Area

Area	Total cropland 1/	Total harvested cropland 1/	Field crops acreages in land capability classes 2/ I	IIE	Total
		1,000 acres			
WE Upland:					
A	2,511	1,276	118	261	379
B	1,017	423	51	131	182
C	2,906	1,082	137	403	540
Total	6,434	2,781	306	795	1,101

1/ 1969 Census of Agriculture.

2/ Conservation Needs Inventory, USDA, 1967. Soils in Class I have few limitations that restrict their use; soils in Class IIE are susceptible to erosion that requires moderate conservation practices.

from ten to 30 miles in width, and extending from Central Alabama through nine counties in Mississippi. However, none of these counties has a total prairie soil-topographical situation. The Clay Hills and Coastal Upland areas lie north of the Prairie area in Alabama and west and north of the prairie area in Mississippi. The Coastal Plains area lies south of the predominately Prairie counties. It encompasses all of the counties in Mississippi south of Rankin county except those bordering the Mississippi River; all of the Florida parishes in Louisiana; and those counties in Alabama west of Butler and Covington counties and south of the Prairie area.

Topography Affects Land Use

Land used in producing row crops in the Clay Hills and Coastal Upland areas is largely determined by topography. In Alabama row crops are produced on first and second terrace soils. Bottom land is extremely narrow and is subject to flood. Thus, timber and permanent pasture predominates along rivers and streams. In Mississippi the terrain is not as rough; bottom lands are wider and first terrace slopes are gentler. Almost all row crops are found on bottom lands with some break over onto first terrace soils. Generally, terrace soils are in native pasture or mixed stands of timber depending on the slope. Field size is usually small and irregular in shape. Erosion is a tremendous problem. A complete fertilizer is required for cotton, corn, and small grains. Soybeans need only phosphate and potash. All crops need lime. Most farmers are using four-row machinery. Terrain features almost preclude the use of larger machinery in the Clay Hills. Considerable cropland would be abandoned if producers shifted to six or eight row equipment.

The topography within the Black Belt or Prairie area is gently rolling to flat. Field size is large; but the irregular shape relfects the impact of adverse terrain features. The soils are predominately heavy clays which are subject to severe sheet erosion. It appears that the particular physical characteristics of these soils limit corn and cotton planting. It is extremely difficult to accomplish primary tillage and seedbed preparation operations early enough in the year to permit the planting of cotton or corn at the optimum time. Soybeans and improved pasture are major open land tenants. All crops require phosphate and potash fertilizers as well as lime. Non-legumes require moderate rates of nitrogen. A major portion of the commercial cotton produced in the area is located on the east side of the Tombigbee River and west of the Alabama line on bottom land soils (figure 5).

The land in the Coastal Plains portion of the area ranges from gently rolling to relatively flat. The topography along streams is extremely rough with bottom land subject to overflow. Field size is larger than in other parts of the area, but it still is irregular in shape with pine forest found on at least two sides. Cotton, corn, and soybeans are the major row crops in this area. All require lime; also phosphate and potash. Cotton and corn require high rates of nitrogen.

Cotton Acreage and Yield Trends

Cotton acreage and yield trends for the WE Upland area are shown below:

Harvested acres through 1974

High - 1949 -- 1,568,075
- 1953 -- 1,066,090
- 1952 -- 1,044,220

Low - 1967 -- 312,160
- 1958 -- 379,600

topography within the Black Belt or [illegible] is gently [illegible] Yield plan is large; but in triangular [illegible] reflects the [illegible] [illegible] Bessemer. The soils are predominately heavy [illegible] severe water erosion. It appears that the particular [illegible] of these soils limit the [illegible] plant [illegible] difficult to accomplish timely tillage [illegible] [illegible] done early enough in the year to permit the planting [illegible] at the optimum time. Soybeans and improved pasture [illegible]. All crops require phosphate [illegible]. Non-legumes require [illegible] rates of nitrogen [illegible] [illegible] produced in this area [illegible] located [illegible] [illegible] River [illegible] of [illegible] 5).

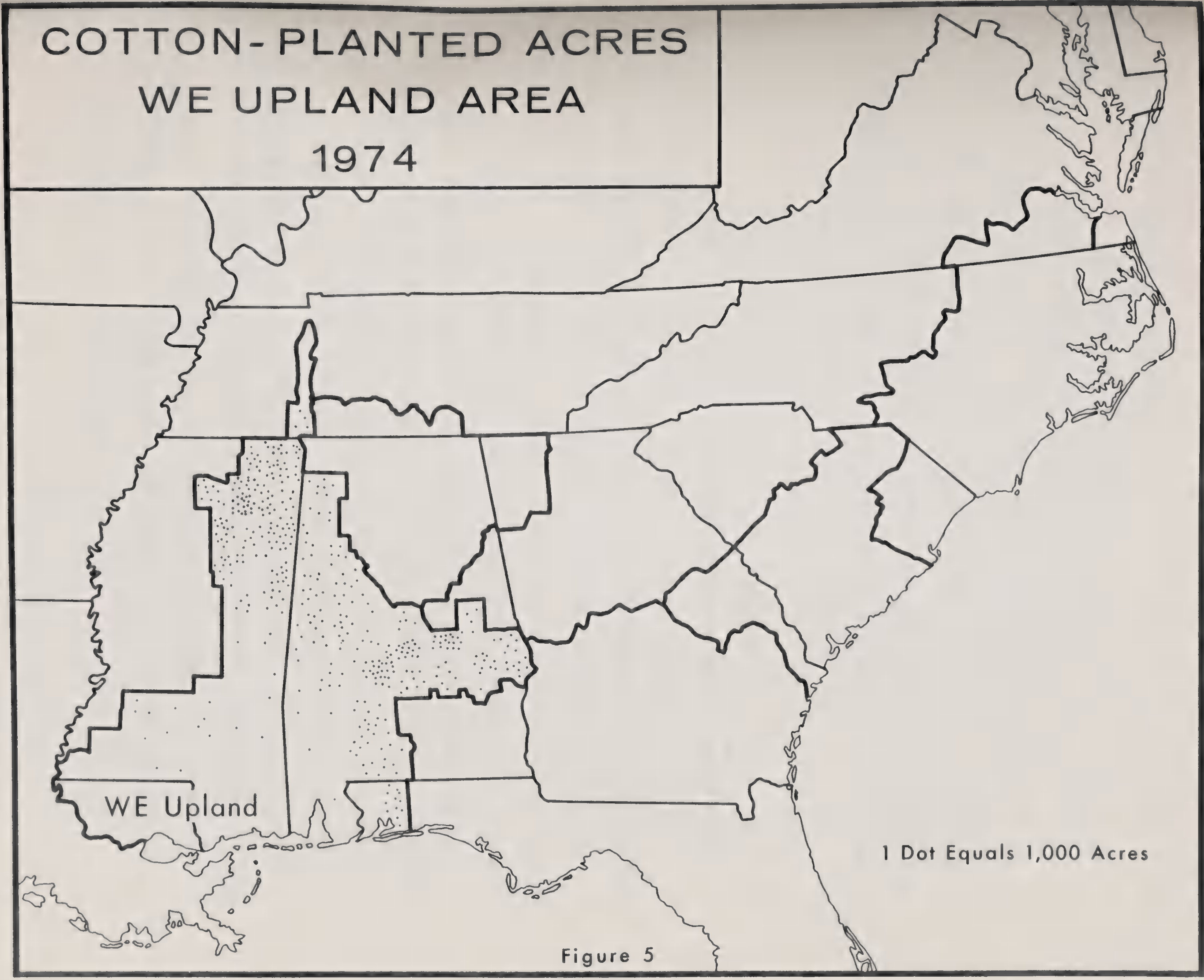
Land in the Coastal Plains portion of the area [illegible] relatively flat. The topography along streams is [illegible] [illegible] subject to overflow. Field size [illegible] but it still is irregular in some [illegible] at least two sides. Cotton, corn, and [illegible] to this area. [illegible] require lime, and phosphate and corn requires high rates of nitrogen.

[illegible] and [illegible] Trends

Acreage and yield trends for [illegible] in Upland [illegible] [illegible] through 1974

1949	—	1,386,075
1953	—	1,096,000
1952	—	1,044,220
1961	—	312,150
1958	-	379,[illegible]

COTTON-PLANTED ACRES
WE UPLAND AREA
1974



1 Dot Equals 1,000 Acres

Figure 5

Lint yield per acre

Median - 1947-61 -- 308 pounds
- 1960-74 -- 423 do.

Average - 1947-56 -- 303 pounds
- 1956-65 -- 410 do.
- 1965-74 -- 432 do.

The trend in cotton acreage has been generally downward since 1949. Yield of lint cotton, on the other hand, increased considerably during the 1950s and into the 1960s with some leveling off occurring in recent years (appendix table 4).

Production Practices and Problems

Commercial cotton growers use mostly four-row or six-row machinery. Currently four-row equipment predominates except in the prairie area. Considerable cropland has been idled because of the adoption of mechanized agriculture. Additional cropland would be abandoned if farmers were to shift to six-row machinery outside the prairie area. Production technology being employed by commercial farmers is excellent. Chemical weed control is almost universally employed. A typical sequence of operations used by commercial growers in producing cotton is: cut stalks, deep plow (moldboard or chisel), broadcast fertilizer, preplant herbicide and disk twice, bed (one-fourth acreage), harrow or drag, plant (one-half acreage with systemic insecticide and/or a banded preemerge), three to five mechanical cultivations (two cultivations with MSMA herbicide and one cultivation with nitrogen fertilizer side dressed), ten to 14 applications of insecticides (40 percent ground and 60 percent air application), defoliate (air), and mechanical harvest over 1.6 times.

Major problems associated with cotton production include: (1) insect control, (2) weed control, (3) efficient marketing, and (4) soil-borne diseases. In every sector agriculturalists and farmers indicated the overwintering boll weevil problem afforded by the favorable habitat and climatic situation necessitates early season control. This action destroys all predators and leaves the crop vulnerable to mid and late season infestations of budworms and bollworms which are extremely difficult to control with currently available materials. Farmers indicated some difficulty in controlling certain broadleaf weeds in cotton and soybeans. Major weeds are cockleburr, tea weed, coffee weed, and morning glory. Soil-borne diseases are a major problem on certain soils.

In Alabama there is considerable interest in group marketing and one variety counties as producers attempt to improve their economic position. Some counties have effective producer controlled marketing agencies; others are in the development stage and some are contemplating such an activity.

It appears that the land currently in cotton, corn, soybeans, small grains, and possibly some pasture land in the prairie is about all of the open land suitable for cropland in a mechanized agricultural environment. Some forest land could be converted to cropland; however, there is no estimate of the amount of land in this category.

Gin capacity is sufficient to meet current cotton acreage demand. However, an expansion in acreage to or above 1975 levels would extend this resource to its upper limit.

Farm Size and Tenure

Farm size is increasing. In 1969 the average commercial farm in this area contained 379 acres. Cropland harvested averaged 82 acres with 13 acres in cotton, 31 acres in soybeans, and 18 acres in corn and other small grains. The balance of the cropland was in hay and tree crops. Most cotton producers own some land and rent additional land. In 1969 full owners accounted for 60 percent of all farm operations and held approximately 50 percent of the land farmed. Part owners accounted for 32 percent of all farms and about 44 percent of the land farmed. It appears there will be a continuous move toward part owners as farmers rent additional lands to utilize effectively their machinery.

Nonfarm Activity

There are several major trade centers located in this area. Additionally, small manufacturing firms have located in large rural communities. Consequently, there are substantial non-farm employment opportunities available. In 1969 almost one-fifth of the commercial farm operators in the area reported working off farm 200 or more days.

LIMESTONE VALLEY

Location of Production

The Limestone Valley is an important cotton area in the Southeast region. Production centers largely in the valley counties in Alabama; however, there are pockets of production in the Sand Mountains, and in

the Georgia and Tennessee portions of the area (figure 6). Historically, about one-third or more of the production has occurred in the Sand Mountain soils.

Madison, Limestone, and Lawrence counties form the core of production in the valley counties, accounting for nearly half of the planted acreage in 1974. Other key counties include Colbert, Lauderdale, and Cherokee.

Soils, Topography, Climate

The soils of the Limestone Valley are predominantly red clay loams. The Upland soils are grey silt loams; the soils of the Sand Mountain sections are sandy loams. Some grey sticky soils are located along the southern edge of the Tennessee Valley and in the northern part of the Coosa Valley. The red clay loam soils are best suited to cotton production.

The topography of the Limestone Valley area ranges from nearly level to rolling terrain. Elevations range from 600 feet in the valley to 1,300 feet in the Sand Mountain sections. The area receives 50 to 56 inches of rainfall annually on the average; the growing season ranges from 200 to 220 days.

Few Growers

A major part of the cotton in the Limestone Valley area is being produced by relatively few growers. These growers are innovators who use improved production practices on cotton and competing crops. They obtain yields year after year that exceed the area average. These people generally prefer cotton to other crops in the farm organization given favorable production and market conditions. However, they would not be reluctant to shift to other crops when the alternative is clearly more profitable than cotton. Most of these farmers own some land and rent additional land

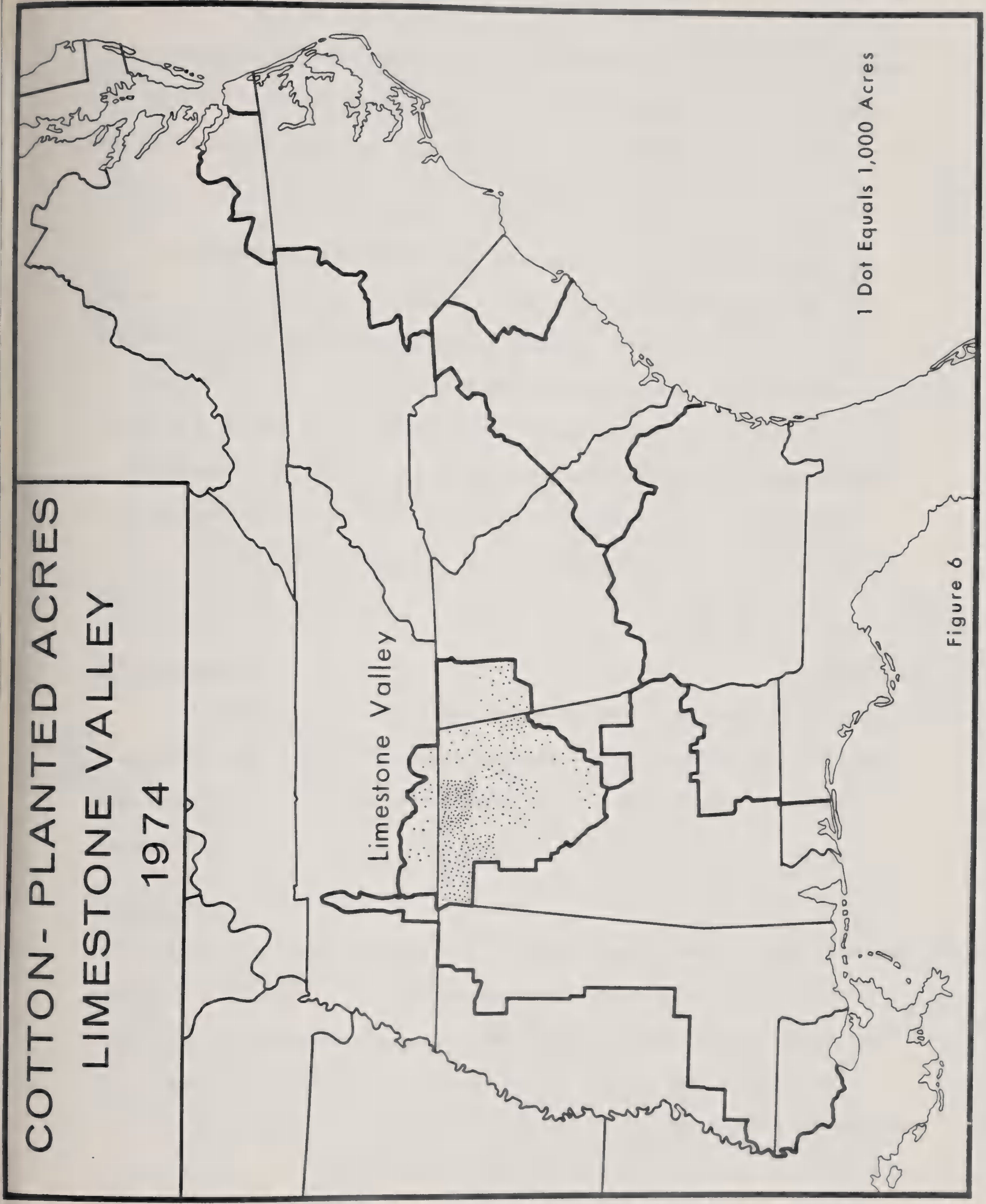

COTTON- PLANTED ACRES
LIMESTONE VALLEY
1974
Limestone Valley
1 Dot Equals 1,000 Acres

Figure 6

to enlarge their farming operation. Share renting is a common practice with the landlord generally paying 25 percent of the cost of seed, fertilizer, and ginning, and receiving 25 percent of the receipts.

Land Resources

The availability of productive cropland in an area often limits the potential for expanding production or shifting to alternative crops. The cropland base in the Limestone Valley includes considerable land that is marginal or unsuited for production of the major crops. Given land use patterns in recent years, increases in the acreage of a crop usually results in decreases in the acreage of one or more competing crops. Consequently, cropland use or the crop mix on most farms depends on the competitive strength of the various crops and to some degree on farmer preferences for one crop over another.

Cropland Base

The Limestone Valley contained about 1.3 million acres of harvested cropland in 1969 (table 5). There has been little change in the cropland base since that time. The main changes have occurred in land uses and productivity.

Cropland Use

Cotton, soybeans, and corn are the main crops produced in the Limestone Valley area (table 6). The soybean enterprise is the main competition to cotton in the valley counties; corn provides the chief competition on the Upland soils. Cotton is not produced on bottomlands near streams and rivers. These soils are better suited to the production of corn and pasture grass crops.

Table 5. Summary of cropland and acreage of field crops in land capability classes I and IIE, Limestone Valley Area, 1969

Subarea	Total cropland	Total harvested cropland 1/	Field crops acreages in land capability classes 2/ I	IIE	Total
		1,000 acres			
A ...	591	316	33	146	179
B ...	975	461	40	282	322
C ...	1,031	380	65	209	274
D ...	472	125	19	46	65
Total	3,069	1,282	157	683	840

1/ 1969 Census of Agriculture.

2/ Conservation Needs Inventory, USDA, 1967. Soils in Class I have few limitations that restrict their use; soils in Class IIE are susceptible to erosion that requires moderate conservation practices. Nearly all of the cotton in the area is restricted to these soils.

Table 6. Planted acreages of major crops in Limestone Valley Area, 1972-76

Crop	Planted cropland (1,000 acres) 1972	1973	1974	1975	1976
Cotton	415	355	396	265	318
Corn, all	208	236	256	287	307
Soybeans.........	402	470	500	655	629
Wheat	63	39	77	89	92
Grain sorghum....	14	14	16	18	18

Source: Statistical Reporting Service, County Statistics 1972-76.

Yield Trends

There has been an upward trend in cotton yields in the Limestone Valley the last several years. Average yield for the period 1947-1956 was 330 pounds per harvested acre; for 1965-1974 it was 430 pounds (table 7). The highest yield during the latter ten-year period was 597 pounds per harvested acre in 1965; the lowest yield was an abnormal 148 pounds in 1967 resulting from extremely unfavorable weather conditions. Acreages and production for all years, 1947-74, are shown in appendix table 5.

Machinery Use

The use of four-row equipment is still a common practice in the valley counties. However, the shift to six-row equipment continues to occur. Most fields are large and suited to the use of six-row equipment.

Production Practices and Problems

The leading cotton growers in the area have developed production systems which are uniquely suited to their own farm situation. These systems include the use of cultural practices and inputs which give superior results in terms of income and production. Although the production systems often vary from farm to farm or from one section of the area to another, there is a high degree of uniformity among farms in practices and input mix.

Insect Control

The management or control of cotton insects is a critical problem facing growers in the Limestone Valley. The boll weevil and cotton bollworms are the most destructive cotton pests in all parts of the area. Spraying to control early season insects often destroys beneficial insects. This practice intensifies the problem of controlling late season pests.

Table 7. Cotton yields for specified time periods, Limestone Valley 1/

Area	Average pounds of lint per acre harvested 1947-56	1956-65	1965-1974
Limestone Valley			
A	336	493	486
B	347	467	409
C	312	415	392
D	286	362	315
Area average	330	456	430

1/ Area delineations are shown in figure 1. The breakdown within the area reflects groups of counties ranging from the most important cotton counties (Area A) to the least important cotton counties (Area D).

Insect control in a normal season requires nine to 12 applications of insecticides extending from July 15 to September 15. About 45 percent of the applications are by air service. The use of ground equipment is more common in early season spraying than in late season coverage. The timing and number of applications are mostly based on field inspections and the recommendation of consulting entomologists.

Generally, disease problems are not widespread in the area. However, the fusarium wilt-nematode complex is a source of trouble at times, particularly in the lighter sandy soils. Usual control practices include planting wilt-tolerant varieties and rotating cotton with other crops. Fumagon or Nemagon are commonly used to control nematodes.

Some observers believe that the heavy use of chemicals in cotton production delays maturity of the crop. This delay in maturity often has an adverse effect on yields and quality of lint.

Weed Control

The usual practice in weed control is to treat the land with a preplant incorporated herbicide, or a preemergence application at planting (applied broadcast or in bands). The preemergence treatment is most common. This treatment is followed with a postemergence application usually after the first cultivation. Treflan and cotoran are the most commonly used herbicides.

Two or three cultivations is a common practice. There is now little, if any,hand weeding of cotton in the area.

Fertilizer Use

Most cotton growers broadcast a mixed fertilizer before planting. About 50 percent of the growers also apply fertilizer at planting. Very little

fertilizer is applied after planting. The trend is toward preplant application of nitrogen. The usual rates are about 90 pounds of nitrogen (N), 60 pounds of phosphate (P_2O_5), and 60 pounds of potash (K_2O). Up to 50 percent of the preplant fertilizer is applied by custom service. Lime is custom applied every two to three years.

Land Preparation

Most cotton growers in the area still use conventional methods of flatbreaking, chiseling, and disking for seed bed preparation. There is some interest in under-row subsoiling and bedding; however, this practice has not been adopted to any great extent by farmers in the valley. The formation of a hard pan is not a problem in the valley soils. However, tractor wheel compaction is a problem in these soils.

The usual sequence of operations for seedbed preparation includes: stalk disposal, flatbreaking with a moldboard plow, chisel, broadcast fertilizer and apply herbicides, incorporate with a tiller, and disk. Lime is usually spread ahead of the fertilizer application.

Flat planting of cotton is still a common practice. The planting operation occurs mostly between April 20 and May 10.

Harvesting and Hauling

Defoliation of cotton ahead of harvest is a common practice. It usually includes one application of a defoliant by air service.

Two-row self-propelled mechanical pickers are now used by most cotton growers. The use of four-bale or six-bale wagons is typical on most cotton farms. The wagons are pulled to the gin by a pickup truck in most cases.

Very little custom harvest or hauling of cotton occurs in the area. The limited custom work usually involves one neighbor helping another.

Crop Rotation

Farmers in the Limestone Valley usually plant cotton on the same land year after year. This practice is most common on the red soils in Madison, Limestone, and Lawrence counties. Growers in this area feel that rotating cotton with other crops, particularly soybeans, reduces the yield of cotton. Although the practice contributes to water erosion, it is not considered a severe problem on most farms. The rotation of cotton with other crops is limited largely to farms experiencing disease control problems. These problems tend to occur on the lighter soils.

REGIONAL SUMMARY

The cotton acreage declined by about two-thirds or more in all production areas of the Southeast region between 1949 and 1972. The downward trend in the acreage planted to cotton may well continue in the years ahead for the region as a whole. Nevertheless, the region includes several groups of contiguous counties where the competitive strength of cotton remains fairly strong. Future shifts in the location of production in the region most likely will depend on the impact of government programs on production and on developments in technology and market conditions affecting relative returns (output) and costs (input) among different commodities in the region, or between the same commodities in different areas.

While corn and soybeans would compete with cotton under some price relationships, tobacco and peanuts always have first claim on land and other resources under current government programs for these crops, and are planted to the limit of the allotment program. Tobacco allotments are located largely in the NE Upland area, and to a much lesser degree in the CE and SE Upland areas where over three-fourths of the cotton from these

areas is grown. Peanut allotments are concentrated in the SE Upland area, and in several counties in the northern part of the NE Upland area. While cotton production appears to be compatible with peanut production in these areas, cotton generally is not important on farms with a fairly large peanut acreage. With few exceptions, cotton production has been declining more significantly in the counties where the peanut enterprise is important.

While cotton growers generally are using improved production practices, several problems continue to plague producers in the region. A major problem in all parts of the region centers around the management or control of insects. Insecticide use constitutes a major component of the cost of producing cotton. The problem is more intense in the southern sections of the region than in the northern sections.

Weed control is another major cost item. Herbicides supplemented with mechanical cultivation are now used almost exclusively to provide weed control in cotton. The most effective weed control system and hence the cost of weed control varies from farm to farm and from one area to another depending on the weed situation, soils, and rainfall in a given year.

A shift to larger machinery and equipment on commercial cotton farms is evident in most production areas of the region. This change is accompanied by field or farm consolidation to enlarge the size of the operation. These changes reflect continuing efforts by farmers to improve production efficiency in the region and thus increase their income from cotton.

Appendix table 1. NE Upland Area, 1947-74

Year	Acres Planted	Acres Harvested	Bales Produced	Lint Yield
1947	478,070	476,380	315,210	317
1948	539,410	538,310	495,100	441
1949	757,454	751,548	375,506	239
1950	434,020	429,140	150,601	168
1951	479,420	574,180	449,069	375
1952	620,350	613,830	436,740	341
1953	666,610	662,610	394.090	285
1954	484,010	480,990	318,120	317
1955	416,620	407,320	228,490	269
1956	398,850	393,620	335,345	408
1957	336,810	334,820	227,194	325
1958	293,780	291,420	252,260	415
1959	375,305	370,705	291,480	377
1960	371,950	363,530	216,110	285
1961	405,200	393,500	256,850	313
1962	409,560	404,060	289,690	344
1963	393,435	385,645	346,091	430
1964	397,715	391,005	368,180	451
1965	375,500	367,820	221,620	289
1966	189,345	147,595	93,420	303
1967	114,610	79,590	52,616	317
1968	209,870	205,280	138,612	324
1969	204,102	181,792	101,336	267
1970	179,881	161,896	146,216	389
1971	192,180	180,250	146,216	389
1972	229,086	186,337	145,778	375
1973	183,525	176,941	180,246	488
1974	171,360	160,756	147,480	440

Average Yield 1947 - 1956 ---- 316.5
Average Yield 1956 - 1965 ---- 364.2
Average Yield 1965 - 1974 ---- 363.1

Yield in ascending order

Year	1947-1961	1960-1974	Year
1950	168	267	1969
1949	239	285	1960
1955	209	289	1965
1960	285	303	1966
1953	285	313	1961
1961	313	317	1967
1954	317	324	1968
1947	317	344	1962
1957	325	375	1972
1952	341	389	1971
1951	375	430	1963
1959	377	434	1970
1956	408	440	1974
1958	415	451	1964
1948	441	488	1973

Appendix table 2. CE Upland area, 1947-74

Year	Acres Planted	Acres Harvested	Bales Produced	Lint Yield
1947	731,510	728,030	443,100	292
1948	790,180	787,700	589,970	359
1949	948,863	951,829	393,570	198
1950	635,900	630,190	311,630	237
1951	868,960	864,150	682,170	378
1952	887,610	879,480	453,830	247
1953	872,270	867,810	497,640	275
1954	630,240	625,380	366,750	281
1955	553,210	544,320	390,990	344
1956	519,980	511,675	399,620	374
1957	382,260	378,690	268,030	339
1958	277,830	274,260	246,240	430
1959	443,190	432,620	325,800	361
1960	445,380	434,080	358,820	396
1961	494,010	485,320	357,170	353
1962	501,100	489,690	386,840	379
1963	461,310	452,170	396,500	420
1964	461,280	454,060	485,400	513
1965	422,170	413,500	457,650	531
1966	308,430	272,340	270,600	476
1967	278,860	183,230	184,440	483
1968	328,890	319,940	237,190	355
1969	325,881	288,211	200,312	339
1970	321,630	281,150	192,845	329
1971	352,270	300,590	268,270	428
1972	371,480	326,998	293,360	430
1973	285,650	285,015	295,630	497
1974	289,430	287,140	281,175	470

Average Yield 1947 - 1956 ---- 299.1
Average Yield 1956 - 1965 ---- 410.2
Average Yield 1965 - 1974 ---- 434.3

Yield in ascending order

Year	1947-1961	1960-1974	Year
1949	198	329	1970
1950	237	339	1969
1952	247	353	1961
1953	275	355	1968
1954	281	379	1962
1947	292	396	1960
1957	339	420	1963
1955	344	428	1971
1961	353	430	1972
1948	359	470	1974
1959	361	476	1966
1956	374	483	1967
1951	378	497	1973
1960	396	513	1964
1958	430	531	1965

Appendix table 3. SE Upland area, 1947-74

Year	Acres Planted	Acres Harvested	Bales Produced	Lint Yield
1947	522,190	520,120	254,170	234
1948	536,110	533,790	316,115	284
1949	807,760	800,970	310,795	186
1950	587,560	577,625	295,245	245
1951	948,490	941,550	631,760	322
1952	978,270	971,100	471,555	233
1953	946,290	940,820	473,730	241
1954	674,130	665,010	442,890	319
1955	572,900	560,580	449,720	385
1956	558,930	535,410	379,720	340
1957	398,940	393,855	281,205	342
1958	287,820	282,710	259,325	440
1959	473,780	458,450	344,485	360
1960	476,005	463,005	384,700	398
1961	506,880	490,300	358,680	351
1962	500,525	488,145	391,140	384
1963	477,370	467,580	494,240	507
1964	488,070	478,080	461,565	463
1965	446,120	434,680	405,537	447
1966	288,700	273,445	231,046	405
1967	235,350	203,865	172,430	405
1968	293,555	281,330	198,736	339
1969	292,255	270,485	194,024	344
1970	281,520	250,060	186,652	358
1971	267,685	237,400	243,640	492
1972	291,945	273,925	250,510	438
1973	253,300	246,145	273,263	532
1974	303,508	293,818	309,285	505

Average Yield 1947 - 1956 ---- 279.2
Average Yield 1956 - 1965 ---- 403.7
Average Yield 1965 - 1974 ---- 427.1

Yield in ascending order

Year	1947-1961	1960-1974	Year
1949	186	339	1968
1952	233	344	1969
1947	234	351	1961
1953	241	358	1970
1950	245	384	1962
1948	284	398	1960
1954	319	405	1966
1951	322	405	1967
1956	340	438	1972
1957	342	447	1965
1961	351	463	1964
1959	360	492	1971
1955	385	505	1974
1960	398	507	1963
1958	440	532	1973

Appendix table 4. WE Upland area, 1947-74

Year	Acres Planted	Acres Harvested	Bales Produced	Lint Yield
1947	981,280	976,490	520,035	255
1948	1,046,120	1,041,970	742,120	341
1949	1,585,625	1,568,075	651,828	199
1950	865,310	849,935	361,940	204
1951	1,022,900	1,006,710	583,490	278
1952	1,050,690	1,044,220	609,480	280
1953	1,076,210	1,066,090	649,590	292
1954	811,815	802,830	498,130	297
1955	705,060	695,670	717,020	494
1956	675,230	660,300	528,245	384
1957	519,670	509,560	327,445	308
1958	387,100	379,600	293,805	371
1959	589,240	572,820	424,390	355
1960	587,550	574,300	493,930	412
1961	644,330	616,680	453,950	353
1962	626,250	610,790	480,150	377
1963	582,760	569,260	630,910	531
1964	586,150	574,050	617,820	516
1965	575,185	559,800	569,240	488
1966	415,265	402,360	354,960	423
1967	368,405	312,160	222,851	342
1968	390,140	362,440	303,599	402
1969	469,046	445,926	371,285	399
1970	413,460	391,523	362,335	444
1971	414,575	402,352	411,649	491
1972	460,922	444,434	419,032	452
1973	387,330	373,095	360,290	463
1974	445,060	429,485	373,661	417

Average Yield 1947 - 1956 ---- 302.9
Average Yield 1956 - 1965 ---- 410.0
Average Yield 1965 - 1974 ---- 432.5

Yield in ascending order

Year	1947-1961	1960-1974	Year
1949	199	342	1967
1950	204	353	1961
1947	255	377	1962
1951	278	399	1969
1952	280	402	1968
1953	292	412	1960
1954	297	417	1974
1957	308	423	1966
1948	341	444	1970
1961	353	452	1972
1959	355	463	1973
1958	371	488	1965
1956	384	491	1971
1960	412	516	1964
1955	494	531	1963

Appendix table 5. Limestone Valley area, 1947-74

Year	Acres Planted	Acres Harvested	Bales Produced	Lint Yield
1947	963,960	961,360	695,410	347
1948	1,060,690	1,055,820	828,370	376
1949	1,210,810	1,199,050	588,190	235
1950	787,940	774,520	334,150	207
1951	796,060	785,680	473,300	289
1952	868,160	863,520	541,080	300
1953	891,280	885,950	608,660	329
1954	653,490	647,540	421,510	312
1955	602,430	596,370	600,150	483
1956	551,410	541,705	474,960	420
1957	431,880	425,150	327,870	370
1958	304,780	297,325	261,155	421
1959	482,500	468,330	497,740	510
1960	515,240	501,050	472,810	452
1961	560,370	533,120	371,620	334
1962	544,600	532,100	415,990	375
1963	480,250	469,750	497,330	508
1964	474,560	463,880	550,000	569
1965	479,160	468,045	582,994	597
1966	354,035	334,780	271,240	388
1967	300,585	126,684	39,146	148
1968	335,195	310,135	236,682	366
1969	343,897	330,705	304,090	441
1970	349,300	338,340	349,157	495
1971	389,190	382,095	468,573	588
1972	416,210	394,193	392,042	477
1973	356,055	342,995	274,091	383
1974	395,200	384,780	330,306	412

Average Yield 1947 - 1956 ---- 330.2
Average Yield 1956 - 1965 ---- 456.1
Average Yield 1965 - 1974 ---- 430.0

Yield in ascending order

Year	1947-1961	1960-1974	Year
1950	207	148	1967
1949	235	334	1961
1951	289	366	1968
1952	300	375	1962
1954	312	383	1973
1953	329	388	1966
1961	334	412	1974
1947	347	441	1969
1957	370	452	1960
1948	376	477	1972
1956	420	495	1970
1958	421	508	1963
1960	452	569	1964
1955	483	588	1971
1959	510	597	1965